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## Developing a Nutrition Assessment Tool for Irish Pre-schools

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# Developing a nutrition assessment tool for Irish pre-schools.

## Introduction

It is acknowledged that nutrition education is a key constituent of lifelong healthy eating and should start from the early stages of life (Pérez-Rodrigo & Aranceta, 2001). Flynn *et al.*, (2006), in reviewing best practice in reducing obesity and related chronic disease in children and young people, noted that there are few such interventions in the pre-school setting and recommended that funding should be directed to develop prevention programmes in this area.

There has been an increase in obesity and overweight observed in school aged children in many countries (Mårild *et al.*, 2004) and this is no different in Ireland with the National Children's Food Survey (Irish Universities Nutrition Alliance, 2005) reporting a 2-fold increase in overweight in school age boys, and a 3-fold increase in obesity in school age girls, since the Irish National Nutrition Survey of 1990 (Irish Nutrition and Dietetic Institute, 1990). The report of the National Taskforce of Obesity (Department of Health and Children (Ireland), 2005) notes that excess body weight is now the most common childhood disease in Europe, with some countries having as many as one in three children overweight or obese. One of its many recommendations is that the Health Service Executive (HSE) in Ireland, in implementing the Childcare Regulations 1996 and (Amendment) Regulations 1997, (Department of Health and Children (Ireland), 1998) should ensure that pre-school services support healthy eating and healthy living.

'The Food and Nutrition Guidelines for Pre-School Services' (Department of Health and Children (Ireland), 2004) recommend that children in full day care (more than 5 hours) are offered at least two meals and two snacks whilst in the pre-school service. Currently in Ireland, there is no uniform formal training for pre-school providers in the area of nutrition and healthy food provision, nor the legislation to enforce such training. As Food & Nutrition Guidelines for pre-schools are not mandatory, methods to encourage the provision of nutritious food in this setting must be investigated, implemented and evaluated.

In 2001, the Community Nutrition and Dietetics and the Pre-School Services of the Health Service Executive (HSE) Dublin Mid-Leinster, Midland Area, in Ireland, coordinated the development of a multi-stakeholder team approach to the nutrition training of pre-school providers; this team included community dietitian; pre-school inspector; training officer; child minding advisory officer and pre-school services manager. A preliminary needs assessment determined that pre-schools were in favour of introducing the model of a nutrition incentive scheme (Guiden & Johnston, 2004). Following on from this investigation, an assessment form to evaluate and score pre-school nutrition practices (Scored Evaluation Form - SEF), based on a review of internationally agreed best nutrition practices in the pre-school setting, was created by the pre-school nutrition team. Nineteen pre-school childcare facilities in the Dublin Mid-Leinster Midland Area (Counties Laois and Offaly) took part in a pilot evaluation of their current nutritional practices using the scored evaluation form devised (Molloy *et al.*, 2007). This demonstrated the need for simplification of the assessment criteria, provision of information on nutrition in the pre-school child for the pre-school providers, practical advice on healthy eating in the pre-school setting and amendment and further investigation of the scoring system. A restructuring of the original Scored Evaluation Form (SEF) was undertaken and funding was obtained from the Health Service Executive and **safefood**, the Food Safety Promotion Board, to further investigate its use in the pre-school setting in a project known as the Healthy Incentive for Preschools (HIP) Project.

The aim of this article is to a) describe the modification and testing of the HIP Project's SEF and b) summarise the findings of a preliminary study of nutritional practices in preschools using the updated Scored Evaluation Form (SEF).

## **Materials and Methods**

### **Sample population**

All eligible full day care pre-schools in one county in Ireland, (Wicklow) (*n* 34), were contacted by the researcher and invited to take part in the study. Pre-schools with any previous contact with the Community Nutrition Service in the Midland Area, that was carrying out the study, were excluded. Twelve pre-schools agreed to participate. Permission to carry out the study in each school was initially obtained by telephone;

written informed consent was also received from each pre-school manager before commencement of the study. Ethical approval for the project was obtained from the Research Ethics Committee of the Health Service Executive Dublin Mid-Leinster, Ireland and the Ethics Committee of the Dublin Institute of Technology.

#### Scored evaluation form (SEF) modification

Each criterion on the original scored evaluation form (SEF) (Table 1) was checked to ensure no overlap between or within criteria existed, and a comprehensive literature review was carried out on each criterion to establish that all criteria were based on evidence of effectiveness.

Literature review was carried out on each of the criterion / questions on the Scored Evaluation Form (SEF). Papers were collected on each criterion in the SEF to determine best practice and compare all aspects of SEF to literature, to ensure the SEF measured best practice. Best practice was defined in the case of each criterion on the SEF. If it was not possible to identify best practice then a common sense approach was taken with the criterion.

Comparison was made between the SEF and the standardised inspection tool used by the Pre-school Inspection Team (PIT) to ensure no overlap between the two tools. The SEF was reviewed also to ensure that there was no overlap of issues within questions on the SEF.

The SEF was broken down into subsections for ease of use; this included sections on: the environment (all ages); weaning (6-12 months only); weaned children (over 12 months); and snacks weaned children (over 12 months). Each section contained six criteria.

**Table 1 An outline of SEF sub-categories and criteria**

<b>Criterion sections and criteria on Scored Evaluation Form</b>
<b>Environment</b>
1. Whole school policy
2. Healthy reward scheme
3. Education activities
4. Planned physical activity
5. Outside in the day
6. Praised for eating
<b>Children under 12 months</b>
7. Weaning food appropriate
8. Feeding selves encouraged
9. Iron rich foods
10. Drinks for infants

11. Unlidded cup
  - Children over 12 months**
  12. Providers sitting with children
  13. Help when eating
  14. Protein portion @ main meal
  15. Starch portion @ main meal
  16. Dairy portion @ main meal
  17. Veg portion @ main meal
  - Snacks**
  18. Fruit as snack
  19. Water with meals
  20. Water between meals
  21. Only drinks offered
  22. Snacks low in fat and sugar only
- 

An altered scoring system was devised based on the literature (Benjamin *et al.*, 2007; Alkon *et al.*, 2008). Following the literature review, the scoring system was revisited and the scoring system for each criterion was changed from a yes/ no system to a 'three way' value system (0; 1; 3). Services would be able to attain one of three possible score: 'does not meet standard' (zero points scored); 'partially meets standard' (one point scored); 'completely meets standard' (three points scored). HIP project criterion standards were created to explain and clarify the scoring system, and a classification range for the scoring system was determined: Participation (Score 0-24); Bronze (Score 25-49); Silver (Score 50 - 74), Gold (Score 75-99); Platinum (Score 100-120).

Drafts of the SEF were sent to Pre-school Inspection Team members and Pre-school Nutrition working group team members throughout the redevelopment phase of the SEF. A multiple choice questionnaire was developed and used with the pre-school inspection team (PIT) in order to determine their knowledge and training needs surrounding the SEF. The Pre-school Inspection Team was requested to use the SEF during one pre-school visit. Feedback was collected from the PIT regarding their thoughts and views on the usability of the SEF in a practical setting.

A detailed assessment tool (DAT) was created to accompany the final SEF. All observations during each service visit were recorded on the Detailed Assessment Tool. In the DAT, each criterion from the SEF is characterised by a series of questions, especially designed for that criterion, which extrapolate and collect background information on the particular criterion, to ensure that evidence for criterion score is gathered. Criterion scores achieved during each pre-school visit

were based on observations made and comparisons of these to the criterion standards developed for the project. An overall score was then assigned to each pre-school service using the SEF.

This assessment tool was used to collect more in-depth information on each of the criteria in the SEF, for future validation purposes.

#### Scored Evaluation Form (SEF) testing

Data were collected in each pre-school service by one researcher using direct observation, noted as the gold standard for accuracy in measuring food in childcare (Gittelsohn *et al.*, 1994). Appointments to visit were made with each pre-school provider, at least two weeks prior to visit. One full day was spent in each pre-school carrying out observation of all aspects of food and nutrition practice. The researcher collected background information, using a detailed standard survey specially created for the HIP project, on each pre-school at the beginning of each pre-school visit. Meal and snack times were noted. Food and fluid given; portion sizes provided; the eating environment established for children and physical activity practices undertaken in each service were observed, and the SEF was used to document and score all information observed and collected. The information used to complete each criterion on the scored evaluation form was also corroborated, during the visit, using the accompanying Data Assessment Tool.

#### Data analysis

All data collected were coded and inputted into the Statistics Package for the Social Sciences (SPSS) for Windows, Version 15 (SPSS Inc., Chicago, IL, USA), and all statistical analysis was carried out using this statistical package. Statistical analysis of frequencies was carried out on all variables. Descriptive exploration for normality and correlation and chi square analysis was also carried out. P values of less than 0.05 were used to indicate statistical significance.

## Results

### Modification of the Scored Evaluation Form

The scored evaluation form was transformed from its original format. Criteria were grouped into sub-sections and each criterion was based on best practice evidence. The scoring system included three possible scores and a categorisation format for overall scores was developed.

While considerable revision of the SEF was undertaken prior to this investigation; this study noted that the sections included in the revised SEF needed further amendment to ensure it could be used in all services regardless of the age of child attending. While many pre-schools did not have children aged less than 12 months, it became apparent that a number of issues which should be relevant only to children aged under 12 months were also pertinent to toddlers over the age of 12 months i.e. provision of: age appropriate consistencies; iron rich food; two handled un-lidded beaker; chair versus high chair; or self feeding versus being fed.

It was also noted that the phrasing of some criteria need alteration to avoid misinterpretation, for example, the necessity to indicate quantity i.e. a glass / portion / 200ml milk.

The inclusion of criteria that will measure 'family style food service' will also be necessary; i.e. to measure number of pre-school providers sitting with children; to determine amount of time allocated to meal and snack times.

The utensils used by children must also be measured; as until now only cup usage was documented. This study demonstrated that provision of plates, cutlery and bottles needed to be assessed in all age groups.

### Pre-school services involved in study

Eleven of the pre-schools visited were privately run and one was a 'not for profit' community based pre-school. Table 2 outlines the characteristics of the pre-schools involved.

**Table 2 Pre-school characteristics (n=12)**

	Mean	SD
No. of carers	6.7	2.4
No. of children	32.7	16.3
No. of boys	14.3	5.9
No. of girls	10.0	4.7
No. of children < 12 m	0.6	1.5
No. of children 12-24 m	7.8	8.2
No. of children 25-36 m	11.3	7.5
No. of children > 36 m	20.2	15.1
No. of rooms in facility	2.9	1.1
Daily care charge to parents (€); when services provide food	40.33	6.43
Weekly expenditure on food (€); when services provide food	136.67	70.94

m, month

€, euro

No., number

SD, standard deviation

#### The scoring system

The overall score in each pre-school service was also determined using the Scored Evaluation Form. Services were divided into two categories for calculating the total score: services with infants less than twelve months: mean score 43 (SD 12.5); and services which had children over 12 months only: mean score 22.5 (SD 4.5).

A negative correlation was noted between: the number of children in the pre-school service and the overall score in services with infants less than twelve months ( $r=-0.41$ ,  $P<0.05$ ); and the number of children in the pre-school service and the overall score in services with children over 12 months only ( $r=-.60$ ,  $P<0.05$ ). Table 3 outlines the scores achieved by each service in each SEF sub-category.

**Table 3 Pre-school scores on the SEF instrument**

Pre-schools	Environment section	< 12m section	> 12m section	Snack section	Overall score (<12m age group in service)	Overall score (>12m age group only in service)
1	12	6	8	3	29	n/a
2	10	12	16	15	53	n/a
3	8	n/a	4	7	n/a	19
4	10	n/a	8	12	n/a	30
5	7	n/a	8	6	n/a	21



6	10	n/a	7	10	n/a	27
7	8	n/a	8	3	n/a	19
8	4	n/a	9	12	n/a	25
9	5	n/a	3	9	n/a	17
10	n/o	n/o	n/o	n/o	n/o	n/o
11	4	n/a	8	10	n/a	22
12	13	14	8	12	47	n/a
<b>Mean</b>	<b>8.27</b>	<b>10.66</b>	<b>7.90</b>	<b>9.00</b>	<b>43</b>	<b>22.5</b>
<b>(SD)</b>	<b>(3.06)</b>	<b>(4.16)</b>	<b>(3.26)</b>	<b>(3.87)</b>	<b>(12.5)</b>	<b>(4.47)</b>

n/a, not applicable

n/o, not observed

SEF, Scored Evaluation Form

SD, standard deviation

M, month

<, less than

>, greater than

### Food and fluid provision

While the majority of pre-schools (*n* 10) provided food on the premises, outside catering companies also provided food (*n* 2), as did parents (*n* 7). No association was noted between adequate portion size provision and the source of the food provided i.e. pre-school, parental or outside catering food provision.

Overall, it was noted that portion sizes provided to infants and toddlers were inadequate. The protein offered to children, at the main meal time, was observed to be less than one serving, in seven of the services visited. In eight services, the vegetable given was observed to be less than one serving; and in nine services no dairy food was provided at the main meal. Six services provided the recommended serving size of starchy food; with one pre-school providing less than one serving; and one providing a serving that was greater than that recommended.

A variety of snacks were provided to children, with fromage frais (*n* 6) and fruit (*n* 9) being the snacks offered with the greatest frequency. Whilst the majority of pre-schools are providing fruit, in most cases it was noted that the amount of fruit given did not constitute a portion. Associations were noted between parental food provision and snack type for some snacks. Significant positive association was noted between parental snack provision and provision of cheese as a snack ( $p=0.024$ ) and some association was noted between parental snack provision and the provision of fromage frais as a snack ( $p=0.061$ ).

While three services provided only milk or water to drink; all other services offered more drink types than this, and juice and dilutable fruit drinks were offered most often. In frequency terms, while seven preschools were noted to provide tap water to drink with meals and snacks; only one pre-school offered tap water outside these times.

#### Food environment

A lack of family style food service was apparent. In three services, providers sat at tables with older children; all children then waited to commence eating until every child at the table had been served their food. In two pre-schools, older children were expected to remain at the table until all children at the table had finished eating.

The feeding of infants and young toddlers to speed up meal times was apparent; with the majority (*n* 8) of services giving assistance to children if they were eating slowly. Encouragement to self feed was lacking in the majority of services, and in many cases infants and young toddlers who were at an age where they could be sitting at age appropriate tables and chairs, were placed in high chairs and spoon fed by providers, without encouragement to self feed at any stage during the meal.

When providers sat with children, and ate with children (*n* 4), the meal / snack was perceived by the researcher to be more pleasant and relaxed as it was noted that providers took time to talk to children about various issues, which was in contrast to those pre-schools where providers stood / knelt beside children and urged them to hurry up or offered to feed the children in an attempt to speed up the meal time.

#### Whole school nutrition policy

Few pre-schools had nutrition policies (*n* 6), and, if available, they had not been produced using the 'whole school' approach to policy development (Southern Health Board, 1999; Department of Health and Children (Ireland), 2004). Only one service displayed their nutrition policy for parents and visitors to see.

#### Physical activity

Some form of physical activity was observed in the majority of services ( $n = 8$ ); however, in all but one service, outdoor activity was not observed if it was raining. Four services provided children with the recommended minimum amount of physical activity of 60 minutes (Department of Health and Children & Health Service Executive, 2009) on the day that the service was visited.

## **Discussion**

This study has enabled the testing of the revised Scored Evaluation Form in the pre-school setting and has allowed each criterion to be explored to ensure its suitability and practicality for further use in this setting. The use of this observation methodology provided a powerful tool to gain in-depth and rich data on individual practices in each service (Simons-Morton & Baranowski, 1991; Gittelsohn *et al.*, 1994) and it has also given some initial insight into the nutrition issues that may need to be addressed in the pre-school setting.

Due to the observations made, further revision of the SEF now needs to take place, before it can be used in future work. Change to overall sub-category structure will be undertaken and criteria will be included to ensure ‘family style food service’ can be assessed.

The direct observation of the plating of food, before distribution, was vital to allow the researcher to determine portion sizes accurately. As it was observed that the portion sizes provided to infants and toddlers were inadequate with poor provision of iron containing, vegetable and dairy foods, it is important that food portion size provision is observed by the researcher and is recorded on the SEF. Previous studies have shown that infants and toddlers have low intakes of iron rich foods, vegetables and dairy foods (Society for Nutrition Education, 2003) and the results of this study provide similar findings.

The development of a food portion atlas and list of household measures for portion sizes are necessary components of an educational resource to accompany the SEF. Pre-school providers need education on portion sizes appropriate for pre-school children of different ages if current practice is to change.

A lack of nutrition policies in pre-schools was also apparent. Those who had a policy, had not produced them using the ‘whole school approach’ to policy development

(Southern Health Board, 1999), the approach regarded as the gold standard in policy production for long lasting, effective policy production (Department of Health and Children (Ireland), 2004).

The time allocated to the provision of meals and snacks in pre-school children's day warrants comment. This study observed that meals tend to be rushed with children being told to hurry up, cleaning taking place, and children leaving the table and being allowed to play while other children are still eating. Many guidelines refer to the educational and health benefits of family style service, with adults sitting, eating, and making conversation with children during mealtimes, allowing children to self serve, allowing sufficient time for meals and providing correct utensils such as plates for all meals and snacks (American Academy of Pediatrics & American Public Health Association, 2002; United States Department of Health and Human Services, 2002; American Dietetic Association, 2005; United States Department of Agriculture, 2008). From the results of this study, it would appear that Irish pre-schools in the majority of cases, do not provide family style service, do not allow adequate time for meals or snacks, do not allow self service and do not provide adequate age appropriate cutlery, plates or drinking vessels for infants and children. It is important that this aspect of pre-school nutrition is also captured and rated in the SEF.

## **Conclusion**

In order to use the SEF to accurately evaluate nutritional practice in the Irish pre-school setting it is necessary to make the changes described to clarify and extend the scope of the assessment criteria and ensure that all questions are unambiguous. The SEF should then be evaluated to determine its utility as an intervention tool whereby its use, in conjunction with practical, supportive education for the pre-school providers may lead to positive changes in nutrition practice in the pre-school setting. This preliminary project highlights the need for such an intervention.

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